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VOLUNTARY WITHDRAWAL FROM ANTI-EPILEPTIC DRUGS: IMPACT ON EMPLOYEE PERFORMANCE, HEALTH AND SAFETY

C Gwandure

*(School of Human and Community Development, University of the
Witwatersrand)*

Abstract

The study sought to investigate the impact of voluntary withdrawal from anti-epileptic drugs on performance, health and safety. Employees with epilepsy working in sheltered workshops participated in the study. There were 100 participants. The results of the study showed depressed performance indicators in the group that had stopped taking medication. The group with controlled epilepsy showed better performance than the group with uncontrolled epilepsy. Health-related absenteeism, and occupational hazard statistics were found to be associated with voluntary withdrawal from anti-epileptic medication.

Introduction

Epilepsy is known by different terms in Zimbabwe and other countries. It is a medical condition that poses a challenge to the working populations. As it is, epilepsy is not considered as a disease but an on and off condition that at law would not be used as adequate medical grounds for failing to employ a job applicant or fail to admit an applicant in a training programme for most of the jobs available on the job market.

Many people living with epilepsy have managed to integrate themselves in schools, colleges, and workplaces without declaring that they have epilepsy. In the traditional Shona culture epilepsy is known as ``tsviyo, zvipusha, or doro``. These terms have negative connotations to such an extent that some schools, colleges and companies may refuse to engage individuals who declare their status on enrolment or contract of employment forms. In hospitals people with epilepsy are treated in the psychiatry department and they queue for medicines with patients who have mental disorders such as schizophrenia. The public, as a cognitive heuristic social categorisation strategy may have negative perceptions about epilepsy. People with epilepsy, the world over, children and adults alike, complain of discrimination, lack of access to health facilities and social support.

Background of the study

This study was prompted by the plight of former students with epilepsy who had graduated from special schools and now working in specialised sheltered workshops for people with disabilities. Epilepsy in this context and purpose of this study was viewed as a handicapping factor in that it was in the moderate to severe continuum of disability categorisation but not in the severe to profound range. This category would be able to work in controlled environments. This study does not imply that people with epilepsy in general need to be monitored at work, it is only this group that was working in a controlled environment that was of interest to this study.

The sheltered workshops have a long history of assisting students from resource units. The participants as employees are regarded as any other employee and the laws regulating labour practice are adhered to for everyone in the workplace. Psychologists, occupational therapists and other professionals would conduct periodical reviews of the cognitive performance and mental health of these workers. The type of work that the employees are involved with is that which will not endanger their life. Instructors supervise work routine. Most of the work sites had a hospital or clinic nearby.

It is against this background that the researcher sought to assess the impact of voluntary withdrawal from anti-epileptic drugs on work performance and occupational health and safety.

Literature review

Definition of Terms

Foster (1997) defines epilepsy as a sudden excessive and rapid discharge of grey matter of some parts of the brain. Forster (1997) further clarifies that epilepsy takes various states of consciousness with or without convulsive movements, somatic sensory systems, visceral motor or sensory symptoms and abnormal speech or behaviour. Epilepsy is a paroxysmal and transitory disturbance of function of the brain that develops suddenly, ceases spontaneously and exhibits a conspicuous tendency to recur. It develops suddenly, ceases spontaneously and exhibits a conspicuous tendency to recur (Forster, 1997).

Occupational health and safety is a discipline that is concerned with protecting the safety, health and welfare of employees, organisations, and others affected by the work they undertake (Wikipedia, 2005). Many organisations have a health and safety department. In Zimbabwe the National Social Security Authority

(NASSA) takes charge of occupational health and safety issues of all registered employer organisations in Zimbabwe.



Forms of epilepsy

Epilepsy is a medical condition that poses challenges to employees and employers alike. People at the workplace may have informed or uninformed explanations about epilepsy when it affects them or others. Every society or group has its own ideas of dealing with the problem apart from conventional medicine. Some patients, for one reason or the other, may choose to voluntarily withdraw from treatment while others may choose to be on medication for the rest of their lives.

People in organisations may experience one form of epilepsy or the other. The forms of epilepsy could be noticeable or may not be recognised as a form of epilepsy. Workplace Counsellors attend to these different manifestations, be they latent or behaviourally expressed. The following types of epileptic seizures are common among the employees who discontinue taking antiepileptic drugs: Generalised Tonic Clonic seizures (GTCS) are sometimes referred to as grandmal seizures. The seizures affect both hemispheres and consciousness is lost (Slater & Roth, 2002; Fugiwara, Sugawara,

Mazaki-Miyazaki, Takahashi, Fukushima, Watanabe, Hara, Morikawa, Yagi, Yamakawa & Inoue, 2003).

The attack usually comes without an aura, a warning of an impending attack. The individual might fall to the ground or experience mood changes, restlessness, headaches and gastrointestinal disorders. Convulsions will take the form of tonic spasm, eye or head rotation. Bodily jerks and brief cessation of respiration will follow. The person would go into a deep sleep after which consciousness will be restored. There will be amnesia for the events of the seizures. The individual would not remember what happened to them before the fall. Confusion, disorientation, disjointed talk or purposeless action might be observable during the early moments of wakefulness. At the workplace the employee may pick up anything for any purpose in confusion. Slater & Roth (2002) say the individual could, for instance, unbutton their trousers to micture at the side of the road, or may pick up an object in a shop and walk out with it, regardless of the impression made on bystanders.

Features of the generalised tonic clonic seizures which could make employees uncomfortable when they were in the company of others at work are; the fall, loss of consciousness, frothing at the mouth, tongue biting and sometimes passing of urine in full view of companions be they male or female.

Petit mal is a type of epilepsy that is characterised by absences. These are brief episodes of loss of consciousness and the person blanks out (Buchanan, 1995; Coulter, Huguenard & Prince, 1990). The typical features are staring, eyes going upwards and eyelids flickering. These episodes last a few seconds, up to thirty seconds and may happen many times a day. The employee would be unconscious even though they might appear to be focused on their task.

Myoclonic seizures are brief, shock-like muscle contractions or jerks occurring singly or repetitively (Goldstein, Nussbaum & Beers (1998; Prasad, Kuzniecky, Knowlton, Welty, Martin, Mendez & Fraught, 2003). Muscle contractions are either rhythmic or sporadic. Tonic clonic seizures normally follow the pattern of stiffened muscles that are accompanied by jerking of the body.

These contractions usually come prior to sleep or after sleep. If such occurrences, are reported to be frequent at work by the employees, it would be advisable for the industrial psychologist to make an onward referral to a neurologist for assessment.

Tonic seizures come with stiffening of the body and the limbs become rigid making it rather difficult for the worker to breathe. The face and lips may go blue (cyanosis) because of inadequate amounts of oxygen in the blood. Individuals lose consciousness and fall to the ground. This loss of consciousness and temporary loss of oxygen could pose an occupational hazard. Clonic seizures follow the tonic phase of the seizures. These are characterised by jerking of the body, relaxation of muscles and resumption of breathing. As breathing begins air is pushed through saliva which would have collected in the mouth, thus creating a froth at the mouth. Some individuals soil themselves during this stage of the seizure (Buchanan, 1995; Bora, Seckin, Zarifoglu, Turan, Sadikoglu, & Ogul, 1995).

Atonic seizures show a marked decrease or loss of postural and muscle tone. It results in drooping of the head, limb or entire body with a brief, if any loss of consciousness (Goldstein et al.1998). The

person is likely to hurt themselves with machinery they are using due to the cessation of the human machine interaction.

Complex partial seizures (CPS) which are also known as psychomotor or temporal lobe seizures are probably the most common type of seizures in all age groups (Buchanan, 1995; Mattson, Cramer, & Collins, 1992). They arise mainly from the temporal lobes but they can also come from frontal, parietal and occipitals lobes although that may happen on rare occasions. Whereas generalised seizures are characterised by abnormal electrical activity involving both hemispheres from the outset and are associated with loss of consciousness, complex partial seizures, on the contrary, start in one cerebral hemisphere and remain localised without spreading to the other hemisphere. A loss or change of awareness could be discernible in the individual but the individual will largely remain conscious of themselves and their immediate environment.

The temporal lobe contains the limbic system in which the heart, blood vessels, respiration and gastrointestinal systems are represented in terms of function. Smell and memory processes are a

function of the temporal lobe. There could be noticeable abnormalities of sensation which may include strange feelings in the abdomen, odd smells, hearing of voices or music and sometimes visual hallucinations (Buchanan 1995). The *deja vu* phenomenon, according to Buchanan (1995) and Bancaud, Brunet-Bourgin, Chauvel and Halgren, (1994) is a distortion where individuals may have a feeling that the situation in which they are is familiar even though they have never been in that setting before. There may also be a disturbance of speech in which the person has difficulty with talking or utters words that may be quite inappropriate at the time. Fears, usually unfounded, are coupled with a feeling of strangeness (Buchanan 1995). Other experiences may be in form of uncanny feelings of change in the outer world or in the self. Depersonalization or derealization and disturbance of bodily images usually take on the character of an illusion such as seeing people as distorted, flattened, elongated or as half images. Slater & Roth (2002) report of sudden feelings of despair, guilt, anxiety and terror.

Premonitions of death or the end of the world may come as an obsession. Basic religious and philosophical doubts, suicidal and aggressive urges form a storm of indescribable thoughts racing through the mind of the individual (Slater & Roth 2002). Some

individuals with epilepsy may develop depression which is characterised by the belief that their condition is controlled by powers beyond their means of control. If epileptic seizures are sometimes accompanied by mild hallucinations, it may pose a challenge to health and safety strategies of organisations.

An aura precedes most of the complex partial seizures. It comes before an attack and acts as a warning to the employee that they will have an attack. The sign could come in form of twitching of some part of the body, sniffing, chewing or lip-smacking movements (Slater & Roth 2002; Gupta, Jeavons, Hughes, & Colins, 1983). When the seizure is over the patient remembers the nature of the aura but hardly remembers the seizure itself. Different people see different forms of the aura.

An employee who is having a complex partial seizure may have a fixed stare and sometimes would not be aware, briefly, of their surroundings. When other people see the employee in that state, they may perceive them as conscious and purposeful in their work related behaviour. Materials could be broken or an accident could be caused but to the outsider, all that could be viewed as intentional or negligence of duty. Automatisms are repeated movements such

as fiddling with hands, licking lips or repeatedly swallowing. These movements could last a few minutes unlike ``absences`` which may last a few seconds to about fifteen seconds. When an employee is experiencing as seizure as an undercurrent, they may respond to questions inappropriately (Slatter & Roth 2002).

Simple partial seizures (SPS) which are also known as focal seizures are common in the general population. They involve one part or one side of the body, depending upon where the brain abnormality is situated. The seizures affect the index finger, thumb, the corner of the mouth and the big toe. The seizure could be generalised to the other parts of the body but the individual will remain conscious during these episodes (Devinsky, Kelly, Porter & Theodore, 1988).

Simple partial seizures need to be understood by workmates as individuals may be harmed or may hurt themselves when they interact with machines and materials. It would also come as a challenge for management to draw a line between deliberate acts of work sabotage and involuntary acts or omissions against the code of conduct.

Status Epilepticus is either a prolonged continuous seizure or repeated seizures with incomplete recovery of consciousness (Buchanan, 1995; DeLorenzo, Pellock, Towne, & Boggs, 1995). It is divided into two categories, namely, non-convulsive status and convulsive status. The seizures could be absences or complex partial status epilepticus without showing any visible action to the observer. An employee will experience episodes of full consciousness and episodes of unconsciousness during the unobservable seizures.

Convulsive status epilepsy involves convulsions that may go on for more than thirty minutes. This calls for a medical emergency. These seizures may cause alarm and despondency to workmates should they occur during work hours. Many organisations have contingent means on site such as first aid kits, industrial clinics or ambulances to referral hospitals.

Causes of epilepsy

Industrial psychologists and human resource practitioners working in the human resource department would find epilepsy as a common workplace problem that is usually recorded in the employees' medical records. These are filed for the purpose of controlling and managing work hours. Medical aid costs for the

organisation is budgeted for and it would be in the best interest of the employer and employees to utilise the benefit. Epilepsy, more often than not, is regarded as a disease when in actual fact it is a medical condition just like asthma or hypertension. Employers are urged to regard people with epilepsy as fit for work and not ill until their condition deteriorates. The following factors are usually seen on employees' medical cards as possible causes of epilepsy:

Brain damage: Any local damage to the brain may set up a focus of abnormal electrical discharges in the brain (Giles & Clark-Wilson 1993; & Santrock, 2003).

Birth trauma: Injuries to the brain in infancy will sometimes result in epilepsy in adulthood (Mirnics, Czikora, Zavec, & Halasz, 2001).

Flashing lights: Reflex epilepsy is triggered off by flashing lights, for instance in cinemas, television and stroboscopic light as in robots (Senanayake, 1990; Manuchehri, Goodman, Siviter, & Nightingale, 2000).

Musical stimulus: Church bells sounding within a discreet frequency range could cause acousticogenic epilepsy (Poskanzer, 1962) (as cited in Slater & Roth 2002).

Genetic epilepsy: The contention that epilepsy runs in families is not yet conclusive. Other researchers are still working on the possibilities of a genetic link to epilepsy (Mulley, Scheffer, Petrou, & Berkovic, 2003). If epilepsy is largely caused by brain damage, it would then make a reasonable argument not to link it to genetics.

Drugs and alcohol: Abuse of alcohol and drugs will sometimes result in psychosis (Lishman, 1987, as cited in Mc Gorry & Jackson, 1999). People with acute psychosis sometimes experience hallucinations and epileptic seizures due to neurological damage.

Cerebral tumors: These are by far the commonest cause of symptomatic epilepsy after the age of thirty years (Forster, 1997).

Unknown causes: Idiopathic epilepsy is not related to any known pathology. Sometimes it appears as if it were linked to hereditary relationships by way of relatives and monozygotic twins showing high concordance rates of developing epilepsy. Any diagnosis of epilepsy for which no cause is identifiable is referred to as idiopathic epilepsy (Buchanan, 1995).

When faced with cases of epilepsy at the workplace, industrial psychologists make inquiries into the nature of the seizures and how they interfere with productivity. They may probe the history of the seizures or may observe the seizures during attacks.

Information on the aura is gathered from the employee for employee counselling purpose. A medical history may give the Industrial psychologist a clue of the aetiology and type of seizure the employee will be presenting with. This will be done in consultation with the Neurologist or Psychiatrist working in the company hospital.

Diagnosis of epilepsy

It is not the role of a psychologist in an organisation to make a diagnosis for epilepsy. Sound referral systems will assist the workplace Counsellors in getting correct information on the medical condition of their employees from medically registered practitioners. Reports by neurologists and psychiatrists will usually indicate the following type of tests for epilepsy:

Electroencephalography (EEG) is primarily the test that is widely used for the diagnosis of epilepsy. It detects electrical alterations associated with epilepsy in the brain. It picks underlying structural lesion and abnormal wave patterns (Davison & Neale, 1987).

Computerised tomography (CT)

This brain scan readily demonstrates many gross focal brain lesions like stroke or tumor. It has become a standard diagnostic procedure

for many suspected and known neurological conditions (Naugle, Cullum & Bigler, 1998).

Magnetic resonance imaging (MRI)

Radio frequency waves are applied to the brain. It can differentiate between grey and white matter, thus identifying abnormalities of the brain. Epilepsy is easily detected.

Positron Emission Tomography (PET)

This neuroimaging technique yields information related to underlying brain activity. It gives information on regional physiological activity. Metabolic rates of glucose or oxygen utilization are monitored and brain dysfunctions such as epilepsy are detected.

Blood Tests: Request for blood tests are sometimes made in order to investigate toxic or metabolic disorders. Blood poisoning could cause seizures.

Although more workers than before are seeking professional assistance through workplace counselling, organisations might still experience situations in which employees or employers will not bother themselves with further assistance after the seizure. When an attack is viewed as a once off event; that may imply future

inaction by the employer and that may endanger the work life of the employee.

Medical Management of epilepsy

Goldstein et al. (1998) point out that between 65% and 80% of patients diagnosed as having epilepsy had complete seizure control with anti-epilepsy drugs (A.E.D) treatment within one year. The pharmacological approach to epilepsy involves the use of medicine to control epilepsy. The following drugs are mainly used in hospitals and clinics: phenobarbital, carbamazepine, valproate, ethosuximide, primidone, diazepam, clonazepam, felbamate, gabapentin, phenytoin and lamotrigine (Goldstein et al. 1998). People might withdraw from taking antiepileptic drugs because of side effects of the drugs such as toxification, nausea or dizziness as shown in Table 1 below.

Table 1: Side Effects of antiepileptic drugs

DRUG	SIDE EFFECT
clonazepam	Sedation, functional slowing, cognitive effect, slurred speech, hyperactivity, salivation
diazepam	Sedation, respiratory depression if given as rapid injection

ethosuximid	Nausea, vomiting, abdominal pain, hiccough, headache, dizziness, lethargy, ataxia, double vision, rash, aplastic anaemia
carbamazepine	Increases the breakdown of the oral contraceptive pill for women resulting in unplanned pregnancy, toxicity, double vision, dizziness, ataxia, nausea, vomiting, rash, low white blood cell count
phenobarbitone	Drowsiness, ataxia, aggression, insomnia, hyperactivity, rash, liver damage, folic acid deficiency, tolerance, habituation, osteomalacia, cognitive problems, poor memory and impotence
phenytoin	Drowsiness, ataxia, double vision, slurred speech, rash, enlarged lymph nodes and hepatitis, gum swelling, acne, increased body hair, coarsened facial features, folic acid deficiency, osteomalacia, cognitive impairment, and depression.
Sodium valproate	Tremor, irritability, nausea, vomiting, pancreatitis, encephalopathy, liver damage, weight gain, hair loss, oedema

Adopted from Buchanan, (1995) .

Effect of voluntary withdrawal from anti-epilepsy drugs

The discontinuation of antiepileptic drugs has been reported to be fatal if the withdrawal is done abruptly. Patients have been reported to collapse unexpectedly, sometimes in the middle of a task. Some people will deteriorate in health. Some episodes of recurrence may not be reported by individuals who would have taken a determined stance against the reinstitution of antiepileptic drugs. It is recommended that discontinuation should be approved by a neurologist or psychiatrist after a seizure free period of at least two years (Verrotti, Trotta, Salladin, Morgese & Chiarelli, 2003; Schmidt & Loscher, 2005). The withdrawal must be guided by the weighted benefits derived from discontinuation against the possible risk to life during a recurrence or relapse.

The purpose of the present study was to examine the impact of voluntary withdrawal from antiepileptic drugs on work performance and health and safety. The study sought to investigate whether there was a difference in performance and in health and safety risk between participants who withdrew from antiepileptic drugs and those who kept on taking anticonvulsive medicine.

Methodology

Research Design: The Post Test Only Control Group Design.

The design considers the current mental functioning of the participants. There is no pretesting to establish prior mental functioning before the onset of epilepsy. The design eliminates the threat to internal validity by eliminating pretesting.

Sample

Employees with epilepsy were drawn from 5 sheltered workshops in Harare and Mashonaland East provinces. The sheltered workshops employed people with various forms of disability. Each workshop in this study constituted a research unit. A total number of 100 employees participated in the research project (n=100 participants). The 5 sheltered workshops had an establishment of 300 employees. The participants were not chosen according to gender ratio. There were 20 selected participants in each research unit. The age of participants ranged from 18 years to 40 years and the average age was 25.

In order to ensure sample representativeness participants who were confirmed as living with epilepsy and had medical reports showing that they had epilepsy were recruited to the study. Confirmation

or institution and the participants had to be above the age of 18 years. The level of ability was controlled for by only allowing participants who were formerly in resource units for the mentally slow (MH or MR). Their intellectual functioning was determined by Educational Psychologists who made placement decisions based on normative scores for such categorisation. Their reasoning skills were in the same category.

British Ability Scales-Basic Number Skills Test C

(British Psychological Society, 1995)

The test assesses number abilities that are used on a daily basis, that is simple addition and subtraction. It begins with addition of two numbers horizontally and vertically. It goes on to addition and subtraction of two digit numbers. Simple fraction addition and subtraction are included. The test is used widely in Schools Psychological Service in Zimbabwe to assess school achievement progress in Schools. The test was used by psychologists in their placement decisions, it was reflected in the assessment review reports. The norms match raw scores with mental age in mathematical ability. For the purpose of the present study, mental ages were not considered. The mental age score shows mental functioning level. It was not required for statistical computation to

determine overall difference in performance between the two groups. Instead, raw scores were considered for quantitative analysis of performance pattern between the two groups. The researcher administered the test and analysed the test scores.

Graded Spelling Test (Daniel & Diack, 1971)

This spelling test is made up of simple words that are used in formal communication. For example in column A, the first word is "on" and the last is "beg". The word formation pattern is simple and regular. Raw scores were used for computation purpose and normative data were set aside. Normative information was not needed for analysing the data. It was one of the battery of tests used by psychologists in their placement of participants in special institutions as was evidenced by their periodic assessment review reports.

Procedure

Workers were informed about the purpose of the test. They were allowed to participate or withdraw from proceedings at will. Management and health staff were assured that classified information they were supposed to provide was for the sake of the present study only and all procedures were held in strict

confidence. Employees on medication and employees that had stopped taking drugs for personal reasons took the test in groups of 20 per work site. This random mixing of participants was done to avoid suspicion on the part of employees. Those that stopped taking medication could have associated any future disciplinary proceedings against them for any offence as victimisation. Participants who were still on medication could have had the perception that their continued reliance on medication was an indication that they would not recover and as such would not be treated fairly by the employer.

After the tests, participants were later called to a structured interview to make an assessment of the personal reasons and feelings that made them stop taking antiepileptic drugs.

Participants who had voluntarily withdrawn taking drugs (Group X1) were asked the following questions:

- 1 Why did you stop taking anti-epilepsy drugs?
- 2 What usually triggers epilepsy at work most of the time?
- 3 What is the effect of epilepsy drugs on your work performance?
- 4 What occupational hazard have you been involved in since you stopped taking antiepileptic medication?

Group X2

This group was made up of employees who were still on anti-epileptic medication. They were asked the following questions:

- 1 Why have you not stopped taking anti-epilepsy drugs?
- 2 What triggers epilepsy at work most of the time?
- 3 Do you experience any problems at work as a result of taking antiepileptic drugs?
- 4 What occupational hazard have you been involved in since you were put on medication?

After the interviews, the responses were analysed qualitatively using information on tape and notes compiled during the interview. Feelings and experiences that were ventilated during the interview were analysed.

Data Analysis

The ``t`` test for independent samples was used to determine the difference in performance between Group X1 and Group X2 in number skills and spelling skills. Numeracy and literacy skills were

used by Mandel, Satalof & Schapiro, (1993) to assess brain recovery after a trauma. The mean test scores of Group X1 were compared with mean test scores of Group X2 in Number skills. The same procedure was repeated for the Spelling test.

Thematic Content Analysis was used to analyse qualitatively the responses given by participants. Brandt, Dawes, Africa, and Swartz, (2004) used Thematic Content Analysis to analyse psychologists' decision-making preferences in custodial evaluations. Reasons for or against taking anti-epilepsy drugs were analysed as well as the discussion on triggers of epilepsy.

Information on work performance and occupational hazard was obtained from human resource records. The company kept a record of all accidents that happened at work. Individual performance cards for all employees were available. The Health and Safety department kept a register of accidents and treatment records at each work site. The accident reports of people with epilepsy were the main focus of the study.

Results

The results of the "t" test are represented in table 2 below. The SAS software was used to analyse the data.

Table 2: Performance on number and spelling skills for groups XI and X2 at 1% significance level

Variable	Group XI Mean	Standard deviation	Group X2 Mean	Standard deviation	T Value	DF	P Value
Maths	4.72	4.48	8	5.36	-3.32	98	0.0013
Spelling	5.04	5.03	9.08	7.08	-3.29	98	0.0014

The difference between the mean test scores in Number skills for Group X1 and Group X2 was statistically significant, $t(98) = -3.32$, $p < .001$. The difference between the two groups in Spelling skills was found to be statistically significant, $t(98) = -3.29$, $p < .001$.

The mean score for X1 in Number skills as shown in Table 2 was 4.72 and the mean for X2 was 8.0. The mean score for X1 in Spelling skills was 5.04 while the mean for X2 was 9.08. Group X2 performed better than Group X1 in both number skills and spelling skills.

The following responses were given by participants during interviews as shown in Table 3 below.

Table 3: Responses given by participants during the interview

Question	Group XI Responses	Group X2 Responses
Why did you stop/not stop taking anti-epilepsy drugs?	Spontaneous recovery Stigma Cultural healing practices Drowsiness and nausea Victimization at work	Hope of full recovery Less incidences of seizure attacks Believed in the efficacy of anti-epilepsy medicine Medication helped them continue working and they got supplies from the employer's industrial clinics

C Gwandure

What usually triggers seizures at work?	Operating vibrating machinery and floors	Vibration
	Working on revolving work stations, moving surfaces, or heights	Circular motion of work station
	Poor factory lighting systems with flickering bulbs,	Poor lighting systems
	facing open flames or welding light	Focusing on a computer screen or digital information display for more than 3 hours
	Digital information displays	Seeing your image in wet surfaces
		Water movement confuses attention

<p>What is the effect of epilepsy drugs on your work performance?</p>	<p>Cause drowsiness and accidents</p> <p>They have a dependence problem</p> <p>They retard progress</p> <p>They cause headaches</p>	<p>They enhance performance</p> <p>You will be able to work without interruptions</p> <p>Seizures will be easy to manage as signs of imminent seizures will be felt</p> <p>If seizures do happen they would not be that fatal when one is on medication</p>
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What workplace hazard have you been involved in because of seizures?	Causing fires	Minor cases of dropping materials
	Causing damage to machinery	
	Causing injury to workmates	
	Falling into the works under a seizure	
	Endangering one's life or self injury during a fall that comes without warning	

Table 4: Employee Annual Performance Record for Groups XI and X2 at work sites 1,2,3,4 and 5

Group XI	Site	1	2	3	4	5	Total	Group X2 Site 1	2	3	4	5	Total
Absenteeism		33	29	34	46	20	162	4	7	6	11	8	36
Performance bonuses		2	0	0	3	2	7	15	17	13	20	12	77

Disciplinary action cases		5	3	8	6	9	31	0	1	3	4	3	11
Sick leave days granted		22	18	13	33	26	112	7	5	8	3	6	29
Rest periods granted during working hours		98	83	60	48	121	410	31	24	19	8	22	104

Table 5. Health and Safety Annual Accident Record

GroupX 1	Site 1	2	3	4	5	Total	G ro u p X 2	S i t e	1	2	3	4	5	T o t a l
Injury while operating machinery	2	1	1	4	3	11			0	1	0	0	1	2
Machinery damage to due seizures	0	0	3	1	2	6			1	0	0	0	0	1

Seizure related deaths	0	0	0	0	0	0			0	0	0	0	0	0
Fatal collapse while working	8	9	2	1 2	9	40			0	1	0	1	0	2
Accidents associated with sleep or drowsiness while working	3	0	2	1	0	6			3	2	2	0	4	1 1

Discussion

The "t" test for Number skills and Spelling skills indicated that Group X2 performed better than Group X1 as shown in Table, 2. The reasons for the difference could be explained using information obtained from the interviews as shown in Table 3. The difference in performance is reflected on the performance record as shown in Table 4. The vulnerability to accidents is shown in the Health and Safety Annual Accident report, Table 5. The information provided by the employees and the information provided by management and health staff is vital in assessing performance and risk factors.

The poor performance of Group X1 could be attributed to neurological impairment that is associated with uncontrolled epilepsy. Convulsive disorders may result in disorders that are related to behavioural, psycho-motor, speech and cognitive impairment. Mandel et al. (1993) reported that minor head trauma could result in cognitive and communicative impairment. The authors noted cognitive deficiencies in interpersonal communication, coding and retrieval of information during task execution. Reasoning and problem-solving skills are affected (Mandel et al., 1993; McFie, 1975). Epilepsy was found to affect motor and sensory functioning, language, attention, learning and memory, visuo-spatial skills, abstraction and cognitive flexibility (Naugale et al., 1998, Hersen, 1989). The lower performance scores for participants in Group X1 would be associated with a deterioration in cognitive capabilities due to the effect of uncontrolled epilepsy in this study. Employees who voluntarily withdrew themselves from treatment were affected worse than employees who continued taking medication as is shown by their performance in simple cognitive activities in Table, 2.

The themes that emerged from the interviews need to be analysed in relation to how they contributed to improved performance for Group X2 and poor performance for Group X1. The evidence given

by participants is largely anecdotal and further research by independent investigators would be needed to verify the concerns, feelings and propositions given by participants with regard to work-related causes of epilepsy, triggers, and effect of epilepsy on performance.

Spontaneous recovery was cited by members of group X1 in Table 3 as the main reason why they stopped taking anti-epilepsy drugs. People with epilepsy sometimes recover on their own without the use of medication. The brain can reorganise itself to compensate for the lost neurons which are not replaceable (Wilson & Braddeley, 1993; Loiseau, Duche, Cordova, Dartigues, & Cohadon, 1988). The problem with this type of recovery is that there would be no guarantee that the seizures will not recur. Besides, it puts people in the human resource department and line management in a difficult situation. They would not be able to guarantee the safety of the employee and would not be able to put in place contingent strategies for workplace seizure attacks as the individual would say they have fully recovered and would not need medication anymore. This aspect would be associated with the poor performance of Group X1 as shown in Table 4 and higher accident figures in Table 5. This false sense of recovery emanates from the notion that infants and children usually grow out of the seizures. It is true, *Benign focal epilepsy* which affects children from three to eleven

years will usually cease and the EEG scores will normalise after puberty with no risk of epilepsy in later life (Buchanan, 1995).

Stigma was mentioned frequently in the study in Table 3 by participants in group X1. Employees from Group X1 withdrew from treatment because they found it embarrassing to take drugs at work. They said epilepsy was associated with schizophrenia and dementia. When they wanted to collect medicine from hospitals or clinics, they would be directed to the Department of Psychiatry where they would queue for supplies with people with schizophrenia, cerebral palsy, psychosis or dementia. Employees from Group X2 did not view the oral intake as stigmatising but regarded it as a medical requirement. It could be argued that the poor performance of Group X1 could have been made worse by trying to hide the epilepsy. Seizures would come unexpectedly and thus disrupt their work.

Cultural Healing Practices contributed to withdrawal from anti-epilepsy medication. This practice is cited in Table 3 as contributory to discontinuation of antiepileptic drugs. Employees from Group X1 believed in traditional healing practices. Some had armbands while others had surgical marks on the forehead, face and

limbs. They believed that the one-off treatment would ward off evil spirits that were allegedly causing the seizures. The religious healing practices were also a feature manifest in Christianity and many other world religions. Employees would visit their faith healers after work. The employees did not deny that they would have seizures at some point during work times but they still believed that God would guide them against misfortunes. The aura that some reported to be in form of a bird or lightning had different meanings. Epilepsy was seen as a disease caused by birds-a euphemism for ghosts. This was a misinterpretation of the aura that resulted in each employee attaching cultural or religious labels to signals of an imminent attack. The participants lacked sufficient information on epilepsy prevention.

The ethical dilemma posed by belief systems to Psychologists in work settings like the one in this study is that of arguing with employees or discouraging them from engaging in religious practices that may be detrimental to health or worker productivity. The employees believed in ghosts, bad luck, evil spirits and witchcraft and were sceptical of modern medicine. Group X2 unlike Group X1 continued to take their medication and hoped to attain full recovery even though they believed in supernatural powers.

The side effects of taking drugs such as *drowsiness and nausea* were reported by Group X1 as contributory to hazard or inefficiency at work. The antiepileptic drugs have a sedative component which causes dizziness and nausea during working hours (Buchanan, 1995). It would be expected that Group X1 employees experienced psychological problems like irritability, mood disorders, low sexual functioning and headaches until they stopped taking the drugs. Participants in Group X2 could have experienced the same but the belief that the gain was better than the pain could have given them the fighting spirit. The majority of Group X2 employees, as shown in Table 3 reported that there was a tendency to increase the dosage during work hours. This could have emanated from the general fears of having an attack at work. If the correct dosage was adhered to dizziness and nausea could have been less likely.

Victimization of employees with epilepsy could have contributed to Group X1 employees quit medication. It was alleged that as soon as management realised that an employee had recurrent epilepsy, they would start to regard the individual as a liability and a cost to the organisation. This was the case despite the fact that the sheltered workshops were meant for people with disabilities. Management would ensure that the employee complied with the medical fitness of employees as required by labour laws. It was

reported by Group X1 employees that some line and human resource managers had little knowledge about epilepsy and as such they treated people with epilepsy as people with schizophrenia. Group X2 was rather proactive, they did not expect victimisation as they realised that they were in sheltered employment already where people with epilepsy were catered for.

The employees from both groups were asked what they considered to be the triggers of epilepsy at the workplace. *Vibrating machinery* was mentioned as one of the factors that made them susceptible to seizures at work as shown in Table 3. Operating grinders, compressors, drill machines and heavy machining equipment without rest periods or as routine work triggered attacks. Improper posture or repeated forceful action coupled with vibrating floors or work surfaces weakened their resilience. This problem is referred to as overuse disorder and will include repetitive strain injuries (Bergh & Theron, 2001).

Revolving work stations were associated with the occurrence of seizures. Moving work-benches or work-surfaces were associated with severe headaches and seizures. Any type of work with

revolving work areas and that which involved moving materials over heights made participants in both groups uncomfortable.

Poor lighting systems in the workshops led to concentration and task focus difficulties as reported in Table 3. Flickering light bulbs and open welding flames were reported to trigger seizures. They also cited loud and sharp workshop noises as precipitating factors. Long hours of human computer interaction were cited as causing headaches and nausea by both groups. Information displays that presented digital information on big screens for which employees were required to monitor made them feel dizzy and some reported migraine headache after long hours of exposure. Refractive images created by large masses of water in pools or reflective light from moving water in canals or work surfaces was included among the things they were uncomfortable with. These uncomfortable feelings could have worsened the vulnerability to seizure of Group X1 participants. Fear of drowning and images of people with epilepsy drowning in swimming pools and rivers and incidences of people with epilepsy falling into flames were very vivid among the participants. The narrations generated much anxiety in both groups. These fears could have spurred Group X2 to continue taking the medication as prescribed.

The effect of drugs on performance was discussed. Group X1 employees withdrew from treatment citing drowsiness, headaches and general interference with work functioning as shown in Table 1. Group X2 reported that the benefits of being on medication outweighed the costs of voluntary withdrawal as reported in Table 3. The two groups agreed that medication had indeed a negative impact on their wakefulness and physiological functioning but with proper drug management, the effect on performance was minimal.

Workplace hazard that Group X1 members reported included causing fires, damage to machinery and causing injury to workmates. This was attributable to uncontrolled seizures that came without warning. Sometimes the fall could be in the works or onto the work-bench resulting in disruption of the systematic movement between people and machinery. Group X2 reported fewer accidents. This could be associated with the efficacy of antiepileptic medication.

When the performance records of employees on anti-epilepsy medication was compared with that of employees who voluntarily withdrew from treatment, it was found that GroupX1 had worse performance indicators than group X2 as shown in Table 4.

Absenteeism was higher in Group X1 than it was in Group X2. This could be linked to seizures that happen at home or on the way to work. This could be covered up through absenteeism. Performance incentives such as bonuses were awarded to employees in Group X2 although a few employees from Group X1 received rewards for good performance. Disciplinary hearings were higher in Group X1 than Group X2. Such sessions indicate a negative work environment that would not be conducive to organisational profitability. The man-hour input was lower for Group X1 due to sick leave. The few days granted as sick leave for Group X2 could be taken to imply that the seizures were less frequent in this group. The result could be linked to the benefits of controlling seizures through medication. Rest periods granted to Group X2 employees exceeded those given to Group X1 as shown in Table 4.

The number of accidents recorded at the five sheltered workshops as indicated in Table 5 indicates that employees who voluntarily withdrew themselves from treatment without approval by medical practitioners had more accidents at work than employees with controlled epilepsy. Figures in Table 5 show higher accidents cases in Group X1 relating to self-injury, machine damage and fatal collapse. There were no recorded deaths from seizures in all the five work sites. Although there were more occupational hazard

cases in Group X1, accidents due to drowsiness while working were higher in Group X2 than Group X1. The anti-epileptic drugs, as sedatives, induce sleep but help relax muscles in mitigation against convulsions. It would be expected that drowsiness would be more observable in Group X2 taking medication than the one that voluntarily stopped treatment as shown in Table 5.

Conclusion

Even though the study shows that people with uncontrolled epilepsy tend to perform worse than people with controlled epilepsy through the use of antiepileptic drugs, it should be noted that such findings would not be used to discriminate against people with uncontrolled epilepsy. Some employees in the study stopped taking medication because of the infrequent supply of drugs by clinics. Anti-epilepsy drugs were reported to be very expensive. Organisations, more often than not, subsidise the medical aid schemes of employees to avoid shortfalls due to the high prices of tablets, neurological scan and blood tests for toxin levels.

It should also be remembered that employees diagnosed with epilepsy and are put on medication may not experience most of the side effects described in this study. By the same token, it should be

noted that employees who voluntarily withdraw from treatment and avoid vulnerable situations such as sleep deprivation, alcohol and stressful engagements may be without seizures for a long time. The recovery could be spontaneous. It is expected that the findings of this study would be used to supplement training material on epilepsy in the workplace and to encourage employees to come out, seek medical advice, and be on medication.

Recommendations

The findings of this study would be more useful to schools, colleges, and workplaces if people would realise that epilepsy is not a disease that is progressive or contagious, but a medical condition that comes on and off. This alteration of an individual's consciousness during a task performance should be controlled by medication to avoid damage to the individual, machinery or workmates. Even though it may seem to be stigmatising to declare one's epilepsy status, the value to safety and life would outweigh the negative perceptions. Organisations would be fairer and more objective should they realise that people with controlled epilepsy are just like any other employees with other medical conditions such as hypertension, diabetes or asthma. Management and shopfloor employees should report to the health department all

forms of seizures that happen at work and they should make a public awareness among all workers that epilepsy will not just disappear forever without treatment.

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